

### Amendments to the Claims

1. (CURRENTLY AMENDED) A vertical power transistor trench-gate semiconductor device (~~100~~) having a trench network (~~STR1, ITR1~~) extending into a semiconductor body (~~10~~) and surrounding a plurality of closed transistor cells (~~TCS~~), wherein the trench network comprises segment trench regions (~~STR1~~) adjacent sides of the transistor cells (~~TCS~~) and intersection trench regions (~~ITR1~~) adjacent corners of the transistor cells, wherein each transistor cell (~~TCS~~) has a source region (~~24~~) and a drain region (~~12~~) which are vertically separated by a channel-accommodating body region (~~23~~) adjacent a segment trench region (~~STR1~~) at each side of the transistor cell, and wherein each segment trench region contains gate material (~~22~~) separated from the semiconductor body (~~10~~) by insulating material (~~21~~) at the vertical sides and at the bottom of the segment trench region (~~STR1~~), wherein the intersection trench regions (~~ITR1~~) each include insulating material (~~21C, 21D~~) which extends from the bottom of the intersection trench region with a thickness which is greater than the thickness of the insulating material (~~21B1~~) at the bottom of the segment trench regions (~~STR1~~), gate material (~~22~~) being provided above the insulating material (~~21C, 21D~~) in the intersection trench regions (~~ITR1~~) and bridging the gate material (~~22~~) in the segment trench regions (~~STR1~~), wherein the greater thickness of the insulating material (~~21C, 21D~~) extending from the bottom of the intersection trench regions (~~ITR1~~) is effective to increase the drain-source reverse breakdown voltage of the device (~~100~~).

2. (CURRENTLY AMENDED) A device as claimed in claim 1, wherein the insulating material (~~21B1~~) is thicker at the bottom of the trench segment regions (~~STR1~~) than at the vertical sides (~~21A1~~) of the trench segment regions so as to reduce the gate-drain capacitance of the device (~~100~~), and wherein the greater thickness of insulating material (~~21C'~~) extending from the bottom of the intersection trench regions (~~ITR1~~) further reduces the gate-drain capacitance of the device.

3. (CURRENTLY AMENDED) A device as claimed in ~~claim 1 or claim 2~~ claim 1, wherein the closed transistor cells (~~TCS~~) are each rectangular shaped with a said segment trench region (~~STR1~~) adjacent each one of four sides of the cell.

4. (CURRENTLY AMENDED) A device as claimed in claim 3, wherein the closed transistor cells (~~TCS~~) are square shaped.

5. (CURRENTLY AMENDED) A device as claimed in ~~claim 3 or claim 4~~claim 3 wherein each intersection trench region (~~ITR1~~) has a square shaped area.

6. (CURRENTLY AMENDED) A device as claimed in ~~claim 3 or claim 4~~claim 3, wherein each intersection region (~~ITR5~~) has a cruciform shaped area.

7. (CURRENTLY AMENDED) A device as claimed in ~~claim 1 or claim 2~~claim 1, wherein the closed transistor cells (~~TCH~~) are each hexagonal shaped with a said segment trench region (~~STR2~~) adjacent each one of six sides of the cell (~~TCH~~).

8. (CURRENTLY AMENDED) A device as claimed in ~~any preceding claim~~claim 1, wherein at least that part of the insulating material (~~21C~~) which extends from the bottom of each intersection trench region (~~ITR1~~) nearest the corners of the adjacent transistor cells (~~TCS~~) extends upwards (~~21A4~~) to thicken the insulating material at least at these corners over at least part of the vertical extent of the channel-accommodating body region (~~23~~) so as to increase the threshold voltage of the device.

9. (CURRENTLY AMENDED) A device as claimed in claim 8, wherein the insulating material (~~21C~~) in each intersection trench region (~~ITR1~~) which is thickened over at least part of the vertical extent of the channel-accommodating region (~~23~~) is so thickened (~~21A4~~) only at a peripheral part of the area of intersection trench region (~~ITR1~~).

10. (CURRENTLY AMENDED) A device as claimed in claim 8, wherein the insulating material (~~21D~~) which extends from the bottom of each intersection trench region (~~ITR1~~) has the same thickness over the whole area of the intersection trench region.

11. (CURRENTLY AMENDED) A device as claimed in ~~any preceding claim~~claim 1, wherein the semiconductor body (~~10~~) is silicon and wherein the insulating material at the bottom (~~21B1~~) of the segment trench regions (~~STR1~~) and the insulating material extending from the bottom (~~21C, 21D~~) of the intersection trench regions (~~ITR1~~) is silicon dioxide.

12. (CURRENTLY AMENDED) A method of making a device as claimed in ~~any preceding claim~~claim 1, the method including

a first sequence of steps (~~Figures 20-25, 30~~) at the conclusion of which there are provided trenches for the intersection trench regions (~~ITR1~~) with the insulating material (~~32~~,

~~32B~~) which extends from the bottom of the intersection trench regions, and in which there are provided empty trenches (~~TR1, TR2~~) for the segment trench regions (~~STR1~~), and

a second sequence of steps (~~Figure 26~~) at the conclusion of which there is provided the insulating material at the vertical sides (~~21A1~~) and bottom (~~21B1~~) of the segment trench regions (~~STR1~~), and also there is provided the gate material (~~22~~) in the segment trench regions and above the insulating material (~~32~~) in the intersection trench regions.

13. (CURRENTLY AMENDED) A method as claimed in claim 12, wherein the first sequence of steps includes

etching a first set of parallel trenches (~~TR1~~) in areas to be occupied by some of the segment trench regions (~~STR1~~) and in areas to be occupied by the intersection trench regions (~~ITR1~~),

providing the insulating material (~~32~~) which will extend from bottom of the intersection trench regions in the final device within and along the whole length of the first set of trenches (~~TR1~~),

etching a second set of trenches (~~TR2~~) in areas to be occupied by the remainder of the segment trench regions (~~STR1~~),

providing a different insulating material (~~33~~) to fill the second set of trenches (~~TR2~~) and to cover the insulating material (~~32~~) in the intersection trench regions (~~ITR1~~),  
removing the insulating material (~~32~~) from the segment trench regions (~~STR1~~) of the first set of trenches (~~TR1~~), and then removing the different insulating material (~~33~~).